

Course Name:	Pre-Calculus & Trigonometry		
Credits:	1		
Prerequisites:	Advanced Algebra (Recommended grade of C or better or by teacher approval)		
Description:	Prepares students for college mathematics. The basic structure of this course is built around the study of functions, their properties, graphs and applications in society. Functions included in this course: linear, polynomial, rational, trigonometric, exponential and logarithmic. Also included in this course is the study of polar coordinates and complex numbers, sequences and series, and probability. The purchase of a graphing calculator is highly recommended for this course. A TI-83 or TI-84 calculator is required.		
Academic Standards:	Wisconsin State Standards in Mathematics (2011)		
Units:	Unit Length:	Unit Standards:	Unit Outcomes:
Functions and Graphs	26 days	HSFBFB3, HSF.IF.A.2, HSF.IF.A.1, HSF.IF.C.8.A, HSF.BF.B.3, HSA-CED.A.2, HSF-BF.A.1a, HSF-LE.A.1b, HSF-LE.A.2, HSF.IF.C.7.B, HSF.IF.C.7.B, HSF.BF.A.1.C, HSF.BF.B.4	Students will use the information in this unit to be able to graph and analyze various types of functions. Students will learn how to describe key aspects of a function and rewrite equations of functions.
Polynomial and Rational Functions	24 days	HSA-SSE.A.2, HSA-SSE.B.3a, HSA.APR.D.6, HSA.APR.A.1, HSA.REI.B.4, HSA.APR.B.2, HSA.REI.A.2, HSF.IF.C.7.D	Students will understand how to factor algebraic expressions and use factoring and division techniques to solve equations. Students will also learn how to simplify and solve expressions and equations with rational terms.
Exponential and Logarithmic Functions	24 days	8.EE.A.1, HSF.LE.A.3, 8.NS.A.1, HSN.RN.A.1, HSN.RN.B.3, HSF.BF.B.5, HSF.LE.A.4	Students will utilize algebraic properties to rewrite exponential and logarithmic expressions. Students will extend their knowledge of logarithms and exponents to solve equations and real world problems.
Basic Triangle Trigonometry	16 days	HSF.TF.A.1, HSG.SRT.C.6, HSG.SRT.C.8, HSG.SRT.D.11	Students will be able to solve right triangles using geometric principles and basic trigonometry. Students will also be able to solve problems involving triangles without right angles using the law of sines and the law of cosines.
Graphs of Trigonometric Functions	15 days	HSF.TF.A.2, HSF.TF.A.3, HSF.TF.B.5, HSF.TF.B.7	Students will memorize the unit circle and use it to find values of trigonometric functions. Students will extend their knowledge of the unit circle to graph both sinusoidal curves as well as other trigonometric functions. Students will also understand how inverse trigonometric functions can be used in trigonometry.
Analytic Trigonometry	17 days	HSF.TF.C.8, HSF.TF.C.9, HSF.TF.B.7	Students will use information learned in this unit about how the interrelationships among the six basic trigonometric functions make it possible to write trigonometric expressions in various equivalent forms.

<b>Unit Name:</b> Functions and Graphs	<b>Length:</b> 26 days
<b>Standards:</b> HSF.BFB.3, HSF.IF.A.2, HSF.IF.A.1, HSF.IF.C.8.A, HSF.BF.B.3, HSA-CED.A.2, HSF-BF.A.1a, HSF-LE.A.1b, HSF-LE.A.2, HSF.IF.C.7.B, HSF.IF.C.7.B, HSF.BF.A.1.C, HSF.BF.B.4	<b>Outcomes:</b> Students will use the information in this unit to be able to graph and analyze various types of functions. Students will learn how to describe key aspects of a function and rewrite equations of functions.
<b>Essential Questions:</b> How can you determine which family a function belongs to? How can you write the domain and range of a function? How can you draw the graph of a given function? How can you perform operations within a function	<b>Learning Targets:</b> Students will be able to: -Graph a function using transformations. -Use interval notation to write a set of real numbers. -Calculate the domain and range of a function both graphically and analytically. -Find and label extrema for a given function. -Determine whether a function is even, odd, or neither both graphically and analytically. -Write an equation in slope-intercept form given enough information. -Graph a piecewise function. -Graph a transformed version of the greatest integer function. -Write a single function defined as the composition of two functions. -Find the inverse of a function and prove that it is the inverse of the original function.
Topic 1: Parent Functions & Transformations	Length: 3 days
Standard(s): HSF.BFB.3	Academic Vocabulary: Stretch, Shrink, Transformation, Translation, Reflection
Lesson Frame:	We will classify families of functions and identify transformations of parent functions. I will graph a function using transformations.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 2: Interval Notation	Length: 2 days
Standard(s): HSF.IF.A.2	Academic Vocabulary: Interval
Lesson Frame:	We will define interval notation. I will use interval notation to write a set of real numbers.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 3: Domain and Range	Length: 3 days
Standard(s): HSF.IF.A.1	Academic Vocabulary: Function, Domain, Range, Vertical Line Test
Lesson Frame:	We will review domain and range as well as how to determine if a graph represents a function. I will calculate the domain and range of a function both graphically and analytically.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 4: Extreme Values	Length: 2 days
Standard(s): HSF.IF.C.8.A	Academic Vocabulary: Extreme Value, Maximum, Minimum, Local/Relative, Absolute, Increasing, Decreasing
Lesson Frame:	We will define and classify various forms of extrema on a function. I will find and label extrema for a given function.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:

<b>Unit Name:</b> Functions and Graphs	<b>Length:</b> 26 days
<b>Standards:</b> HSF.BFB.3, HSF.IF.A.2, HSF.IF.A.1, HSF.IF.C.8.A, HSF.BF.B.3, HSA-CED.A.2, HSF-BF.A.1a, HSF-LE.A.1b, HSF-LE.A.2, HSF.IF.C.7.B, HSF.IF.C.7.B, HSF.BF.A.1.C, HSF.BF.B.4	<b>Outcomes:</b> Students will use the information in this unit to be able to graph and analyze various types of functions. Students will learn how to describe key aspects of a function and rewrite equations of functions.
<b>Essential Questions:</b> How can you determine which family a function belongs to? How can you write the domain and range of a function? How can you draw the graph of a given function? How can you perform operations within a function	<b>Learning Targets:</b> Students will be able to: -Graph a function using transformations. -Use interval notation to write a set of real numbers. -Calculate the domain and range of a function both graphically and analytically. -Find and label extrema for a given function. -Determine whether a function is even, odd, or neither both graphically and analytically. -Write an equation in slope-intercept form given enough information. -Graph a piecewise function. -Graph a transformed version of the greatest integer function. -Write a single function defined as the composition of two functions. -Find the inverse of a function and prove that it is the inverse of the original function.
Topic 5: Even and Odd Functions	Length: 2 days
Standard(s): HSF.BF.B.3	Academic Vocabulary: Symmetry, Even Function, Odd Function
Lesson Frame:	We will explore even and odd functions and symmetry within a function. I will determine whether a function is even, odd, or neither both graphically and analytically.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	
Topic 6: Linear Functions	Length: 3 days
Standard(s): HSA-CED.A.2, HSF-BF.A.1a, HSF-LE.A.1b, HSF-LE.A.2	Academic Vocabulary: Slope, Intercept, Slope-Intercept Form, Point-Slope Form, Parallel, Perpendicular
Lesson Frame:	We will review linear functions in slope-intercept form. I will write an equation in slope-intercept form given enough information.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 7: Piecewise Functions	Length: 3 days
Standard(s): HSF.IF.C.7.B	Academic Vocabulary: Piecewise Function
Lesson Frame:	We will explore how to read and graph piecewise-defined functions. I will graph a piecewise function.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 8: Greatest Integer Function	Length: 2 days
Standard(s): HSF.IF.C.7.B	Academic Vocabulary: Integer, Greatest Integer Function, Step Function
Lesson Frame:	We will practice graphing step functions and define the greatest integer operation. I will graph a transformed version of the greatest integer function.

<b>Unit Name:</b> Functions and Graphs	<b>Length:</b> 26 days
<b>Standards:</b> HSF.BF.B.3, HSF.IF.A.2, HSF.IF.A.1, HSF.IF.C.8.A, HSF.BF.B.3, HSA-CED.A.2, HSF-BF.A.1a, HSF-LE.A.1b, HSF-LE.A.2, HSF.IF.C.7.B, HSF.IF.C.7.B, HSF.BF.A.1.C, HSF.BF.B.4	<b>Outcomes:</b> Students will use the information in this unit to be able to graph and analyze various types of functions. Students will learn how to describe key aspects of a function and rewrite equations of functions.
<b>Essential Questions:</b> How can you determine which family a function belongs to? How can you write the domain and range of a function? How can you draw the graph of a given function? How can you perform operations within a function	<b>Learning Targets:</b> Students will be able to: -Graph a function using transformations. -Use interval notation to write a set of real numbers. -Calculate the domain and range of a function both graphically and analytically. -Find and label extrema for a given function. -Determine whether a function is even, odd, or neither both graphically and analytically. -Write an equation in slope-intercept form given enough information. -Graph a piecewise function. -Graph a transformed version of the greatest integer function. -Write a single function defined as the composition of two functions. -Find the inverse of a function and prove that it is the inverse of the original function.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 9: Composite Functions	Length: 2 days
Standard(s): HSF.BF.A.1.C	Academic Vocabulary: Function Composition
Lesson Frame:	We will explore operations that can be used between operations including function composition. I will write a single function defined as the composition of two functions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 10: Inverse Functions	Length: 2 days
Standard(s): HSF.BF.B.4	Academic Vocabulary: Inverse
Lesson Frame:	We will define the inverse of a function and investigate inverse operations. I will find the inverse of a function and prove that it is the inverse of the original function.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:

<b>Unit Name:</b> Polynomial and Rational Functions	<b>Length:</b> 24 days
<b>Standards:</b> HSA-SSE.A.2, HSA-SSE.B.3a, HSA.APR.D.6, HSA.APR.A.1, HSA.REI.B.4, HSA.APR.B.2, HSA.REI.A.2, HSF.IF.C.7.D	<b>Outcomes:</b> Students will understand how to factor algebraic expressions and use factoring and division techniques to solve equations. Students will also learn how to simplify and solve expressions and equations with rational terms.
<b>Essential Questions:</b> How can you choose the best factoring technique for a given polynomial? How can you manipulate and analyze functions with rational expressions? How can you find the roots of any given polynomial equation?	<b>Learning Targets:</b> Students will be able to: - Factor a trinomial with a leading coefficient that is not 1 into binomials. - Use grouping to factor a third degree polynomial. - Simplify a rational expression and state its excluded values - Use synthetic division to find the quotient of two polynomials and included the remainder. - Pick the simplest method necessary and use it to solve a quadratic equation. - Find the rational zeros of a cubic polynomial. - Solve a rational equation and check to make sure I don't have extraneous solutions. - Analytically find the asymptotes of a rational function and use them to draw a graph.
Topic 1: Factoring Trinomials	Length: 2 days
Standard(s): HSA-SSE.A.2, HSA-SSE.B.3a	Academic Vocabulary: Monomial, Trinomial, Factor, FOIL
Lesson Frame:	We will review factoring trinomials by both removing common factors and using th FOIL pattern. I will factor a trinomial with a leading coefficient that is not 1 into binomials.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 2: Advanced Factoring Methods	Length: 3 days
Standard(s): HSA-SSE.A.2	Academic Vocabulary: Factor, Grouping, Difference/Sum of Cubes
Lesson Frame:	We will explore advanced factoring methods and use them to factor polynomials with a degree greater than 2. I will use grouping to factor a third degree polynomial.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 3: Rational Expressions	Length: 3 days
Standard(s): HSA.APR.D.6	Academic Vocabulary: Rational Expression, Excluded Values
Lesson Frame:	We will investigate rules for simplifying rational expressions. I will simplify a rational expression and state its excluded values
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 4: Synthetic and Long Division	Length: 2 days
Standard(s): HSA.APR.A.1	Academic Vocabulary: Quotient, Remainder, Synthetic Division
Lesson Frame:	We will explore the processes used for dividing one polynomial by another. I will use synthetic division to find the quotient of two polynomials and included the remainder.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:

<b>Unit Name:</b> Polynomial and Rational Functions	<b>Length:</b> 24 days
<b>Standards:</b> HSA-SSE.A.2, HSA-SSE.B.3a, HSA.APR.D.6, HSA.APR.A.1, HSA.REI.B.4, HSA.APR.B.2, HSA.REI.A.2, HSF.IF.C.7.D	<b>Outcomes:</b> Students will understand how to factor algebraic expressions and use factoring and division techniques to solve equations. Students will also learn how to simplify and solve expressions and equations with rational terms.
<b>Essential Questions:</b> How can you choose the best factoring technique for a given polynomial? How can you manipulate and analyze functions with rational expressions? How can you find the roots of any given polynomial equation?	<b>Learning Targets:</b> Students will be able to: - Factor a trinomial with a leading coefficient that is not 1 into binomials. - Use grouping to factor a third degree polynomial. - Simplify a rational expression and state its excluded values - Use synthetic division to find the quotient of two polynomials and included the remainder. - Pick the simplest method necessary and use it to solve a quadratic equation. - Find the rational zeros of a cubic polynomial. - Solve a rational equation and check to make sure I don't have extraneous solutions. - Analytically find the asymptotes of a rational function and use them to draw a graph.
Topic 5: Solving Quadratic Equations	Length: 3 days
Standard(s): HSA.REI.B.4	Academic Vocabulary: Root, Zeros, Quadratic Formula
Lesson Frame:	We will review three processes for solving a quadratic equation. I will pick the simplest method necessary and use it to solve a quadratic equation.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 6: Rational Root Theorem	Length: 3 days
Standard(s): HSA.APR.B.2	Academic Vocabulary: Rational Root, Zeros
Lesson Frame:	We will explore how to use the rational root theorem to find possible solutions zeros of a polynomial. I will find the rational zeros of a cubic polynomial.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 7: Solving Rational Equations	Length: 3 days
Standard(s): HSA.REI.A.2	Academic Vocabulary: Rational Equation, Extraneous Solution
Lesson Frame:	We will investigate processes for solving rational equations. I will solve a rational equation and check to make sure I don't have extraneous solutions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 8: Graphing Rational Functions	Length: 3 days
Standard(s): HSF.IF.C.7.D	Academic Vocabulary: Asymptote, End Behavior, Discontinuity,
Lesson Frame:	We will explore asymptotic behavior on rational functions. I will analytically find the asymptotes of a rational function and use them to draw a graph.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:

<b>Unit Name:</b> Exponential and Logarithmic Functions	<b>Length:</b> 24 days		
<b>Standards:</b> 8.EE.A.1, HSF.LE.A.3, 8.NS.A.1, HSN.RN.A.1, HSN.RN.B.3, HSF.BF.B.5, HSF.LE.A.4	<b>Outcomes:</b> Students will utilize algebraic properties to rewrite exponential and logarithmic expressions. Students will extend their knowledge of logarithms and exponents to solve equations and real world problems.		
<b>Essential Questions:</b> How can you use an exponential growth or decay model to solve a real world problem? How can you rewrite exponential and logarithmic expressions using algebraic properties? How can you solve equations containing exponents and logarithms?	<b>Learning Targets:</b> Students will be able to: - Simplify expression using the rules of exponents. - Graph an exponential growth and an exponential decay model. - Simplify expressions that include the number e. - Rewrite expressions from radical form into exponent form and vice versa. - Rewrite expressions in logarithmic form into exponential form and vice versa. - Utilize the properties of logarithms to condense and expand logarithmic expressions. - Evaluate logarithms using the change of base formula. - Use logarithms to solve exponential equations. - Use exponents to solve logarithmic equations.		
<b>Topic 1:</b> Rules of Exponents	<b>Length:</b> 3 days		
<b>Standard(s):</b> 8.EE.A.1	<b>Academic Vocabulary:</b> Exponent, Base, Zero Power Rule		
<b>Lesson Frame:</b>	We will review the rules of exponents. I will simplify expression using the rules of exponents.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 2:</b> Graphing Exponential Functions	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSF.LE.A.3	<b>Academic Vocabulary:</b> Exponential Growth, Exponential Decay		
<b>Lesson Frame:</b>	We will investigate graphs of exponential equations and use them in mathematical models. I will graph an exponential growth and an exponential decay model.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 3:</b> Euler's Number	<b>Length:</b> 2 days		
<b>Standard(s):</b> 8.NS.A.1	<b>Academic Vocabulary:</b> The Number e		
<b>Lesson Frame:</b>	We will analyze Euler's number and its importance in real-world situations. I will simplify expressions that include the number e.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 4:</b> Radicals and Rational Exponents	<b>Length:</b> 3 days		
<b>Standard(s):</b> HSN.RN.A.1, HSN.RN.B.3	<b>Academic Vocabulary:</b> Index, Radical Expression, Radicand, Rational Exponent		
<b>Lesson Frame:</b>	We will explore the connection between rational exponents and radicals. I will rewrite expressions from radical form into exponent form and vice versa.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 5:</b> Basic of Logarithms	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSF.BF.B.5	<b>Academic Vocabulary:</b> Exponential Form, Logarithmic Form		
<b>Lesson Frame:</b>	We will define the operation of logarithm and explore its meaning. I will rewrite expressions in logarithmic form into exponential form and vice versa.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 6:</b> Properties of Logarithms	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSF.BF.B.5	<b>Academic Vocabulary:</b> Power Rule, Product Rule, Quotient Rule		
<b>Lesson Frame:</b>	We will define the basic properties of logarithms. I will utilize the properties of logarithms to condense and expand logarithmic expressions.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 7:</b> Change of Base Formula	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSF.BF.B.5	<b>Academic Vocabulary:</b> Change of Base Formula		
<b>Lesson Frame:</b>	We will learn the change of base formula and how it can be used to evaluate logarithms I will evaluate logarithms using the change of base formula.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 8:</b> Solving Exponential Equations	<b>Length:</b> 3 days		

<b>Unit Name:</b> Exponential and Logarithmic Functions	<b>Length:</b> 24 days		
<b>Standards:</b> 8.EE.A.1, HSF.LE.A.3, 8.NS.A.1, HSN.RN.A.1, HSN.RN.B.3, HSF.BF.B.5, HSF.LE.A.4	<b>Outcomes:</b> Students will utilize algebraic properties to rewrite exponential and logarithmic expressions. Students will extend their knowledge of logarithms and exponents to solve equations and real world problems.		
<b>Essential Questions:</b> How can you use an exponential growth or decay model to solve a real world problem? How can you rewrite exponential and logarithmic expressions using algebraic properties? How can you solve equations containing exponents and logarithms?	<b>Learning Targets:</b> Students will be able to: - Simplify expression using the rules of exponents. - Graph an exponential growth and an exponential decay model. - Simplify expressions that include the number e. - Rewrite expressions from radical form into exponent form and vice versa. - Rewrite expressions in logarithmic form into exponential form and vice versa. - Utilize the properties of logarithms to condense and expand logarithmic expressions. - Evaluate logarithms using the change of base formula. - Use logarithms to solve exponential equations. - Use exponents to solve logarithmic equations.		
<b>Standard(s):</b> HSF.LE.A.4	<b>Academic Vocabulary:</b> Exponential Equation		
<b>Lesson Frame:</b>	We will explore strategies for solving exponential equations.		
	I will use logarithms to solve exponential equations.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 9: Solving Logarithmic Equations</b>	<b>Length:</b> 3 days		
<b>Standard(s):</b> HSF.BF.B.5	<b>Academic Vocabulary:</b> Logarithmic Equation		
<b>Lesson Frame:</b>	We will explore strategies for solving logarithmic equations.		
	I will use exponents to solve logarithmic equations.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		



<b>Unit Name:</b> Basic Triangle Trigonometry	<b>Length:</b> 16 days		
<b>Standards:</b> HSFT.F.A.1, HSG.SRT.C.6, HSG.SRT.C.8, HSG.SRT.D.11	<b>Outcomes:</b> Students will be able to solve right triangles using geometric principles and basic trigonometry. Students will also be able to solve problems involving triangles without right angles using the law of sines and the law of cosines.		
<b>Essential Questions:</b> How can you solve real world problems involving right triangle? What trigonometric properties can be used to solve problems involving triangles without right angles?	<b>Learning Targets:</b> Students will be able to: -Convert back and forth between radian and degree measurements for angles. -Calculate the sides of a 45-45-90 and a 30-60-90 right triangle. -Use sohcahtoa to solve for the angles and sides of a right triangle. -Use the law of cosines to solve a real world story problem. -Use the law of sines to solve a real world story problem. -Solve a real life problem using a trigonometric property.		
<b>Topic 1:</b> Angles in Radians and Degree	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSFT.F.A.1	<b>Academic Vocabulary:</b> Degree, Radian, Coterminal Angle, Quadrantal Angle, Standard Position		
<b>Lesson Frame:</b>	We will define what a radian is and how it can be used to measure angles. I will convert back and forth between radian and degree measurements for angles.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 2:</b> Special Right Triangles	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSG.SRT.C.6	<b>Academic Vocabulary:</b> Special Right Triangle (30-60-90, 45-45-90)		
<b>Lesson Frame:</b>	We will review finding lengths of sides of special right triangles. I will calculate the sides of a 45-45-90 and a 30-60-90 right triangle.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 3:</b> Right Triangle Trigonometry	<b>Length:</b> 3 days		
<b>Standard(s):</b> HSG.SRT.C.8	<b>Academic Vocabulary:</b> Trigonometric Function, Hypotenuse, Sine, Cosine, Tangent, Sohcahtoa		
<b>Lesson Frame:</b>	We will define the basic trigonometric functions and understand how they can be used to solve right triangles. I will use sohcahtoa to solve for the angles and sides of a right triangle.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 4:</b> Law of Cosines	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSG.SRT.D.11	<b>Academic Vocabulary:</b> Law of Cosines		
<b>Lesson Frame:</b>	We will define the law of cosines and explore how to use it to solve for the angles and sides of a triangle. I will use the law of cosines to solve a real world story problem.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 5:</b> Law of Sines	<b>Length:</b> 2 days		
<b>Standard(s):</b> HSG.SRT.D.11	<b>Academic Vocabulary:</b> Law of Sines		
<b>Lesson Frame:</b>	We will define the law of sines and explore how to use it to solve for the angles and sides of a triangle. I will use the law of sines to solve a real world story problem.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		
<b>Topic 6:</b> Applications of Basic Triangle Trigonometry	<b>Length:</b> 3 days		
<b>Standard(s):</b> HSG.SRT.C.8	<b>Academic Vocabulary:</b> Angle of Depression, Angle of Elevation		
<b>Lesson Frame:</b>	We will practice modeling real life situations that can be solved with trigonometric properties. I will solve a real life problem using a trigonometric property.		
<b>Performance Tasks:</b> Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	<b>Notes:</b>		

<b>Unit Name:</b> Graphs of Trigonometric Functions	<b>Length:</b> 15 days
<b>Standards:</b> HSF.TF.A.2, HSF.TF.A.3, HSF.TF.B.5, HSF.TF.B.7	<b>Outcomes:</b> Students will memorize the unit circle and use it to find values of trigonometric functions. Students will extend their knowledge of the unit circle to graph both sinusoidal curves as well as other trigonometric functions. Students will also understand how inverse trigonometric functions can be used in trigonometry.
<b>Essential Questions:</b> How can the unit circle be used to find exact measurements of trigonometric functions? How can a sinusoidal curve be used to model a real world problem? How can inverse trigonometric functions be used find angles in triangles?	<b>Learning Targets:</b> Students will be able to: -Memorize the unit circle and use it to find exact values of trigonometric functions. -Graph a sinusoidal function with multiple transformations. -Draw the graph of a tangent function. -Find the value of an inverse trigonometric expression using the unit circle.
Topic 1: The Unit Circle	Length: 4 days
Standard(s): HSF.TF.A.2, HSF.TF.A.3	Academic Vocabulary: Cosecant, Cotangent, Secant
Lesson Frame:	We will define all the values on the unit circle and practice memorizing them. I will memorize the unit circle and use it to find exact values of trigonometric functions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 2: Sinusoidal Functions	Length: 4 days
Standard(s): HSF.TF.B.5	Academic Vocabulary: Sinusoidal Curve, Amplitude, Period, Phase Shift, Vertical Shift
Lesson Frame:	We will investigate graphs of sine and cosine functions and how they can be transformed. I will graph a sinusoidal function with multiple transformations.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 3: Graphs of Other Trigonometric Functions	Length: 2 days
Standard(s): HSF.TF.A.3	Academic Vocabulary: Asymptotes
Lesson Frame:	We will explore graphs of tangent, cotangent, secant, and cosecant functions. I will draw the graph of a tangent function.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	We will:
Topic 4: Inverse Trigonometric Functions	Length: 3 days
Standard(s): HSF.TF.B.7	Academic Vocabulary: Inverse Trigonometric Function, Arc(sin,cos,...)
Lesson Frame:	We will define inverse trigonometric functions and connect them to the standard trigonometric operations. I will find the value of an inverse trigonometric expression using the unit circle.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:

<b>Unit Name:</b> Analytic Trigonometry	<b>Length:</b> 17 days
<b>Standards:</b> HSF.TF.C.8, HSF.TF.C.9, HSF.TF.B.7	<b>Outcomes:</b> Students will use information learned in this unit about how the interrelationships among the six basic trigonometric functions make it possible to write trigonometric expressions in various equivalent forms.
<b>Essential Questions:</b> How are algebraic properties related to trigonometric functions? How can you rewrite a trigonometric expression into a more useful form? How can you use trigonometric identities to solve equations?	<b>Learning Targets:</b> Students will be able to: -Use basic trigonometric identities to simplify expressions. -Use the pythagorean identities in conjunction with previous knowledge to simplify expressions. -Use the sum and difference identities in conjunction with previous knowledge to simplify expressions. -Use knowledge of all trigonometric identities to simplify expressions with trigonometric functions. -Solve a trigonometric equation using an identity and inverse trigonometry.
Topic 1: Basic Trigonometric Identities	Length: 3 days
Standard(s): HSF.TF.C.8	Academic Vocabulary: Reciprocal Identities, Cofunction Identities, Even/Odd Identities, Quotient Identities
Lesson Frame:	We will define four basic sets of trigonometric identities. I will use basic trigonometric identities to simplify expressions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 2: Pythagorean Identities	Length: 2 days
Standard(s): HSF.TF.C.8	Academic Vocabulary: Pythagorean Identities
Lesson Frame:	We will define and prove the pythagorean identities of trigonometry, I will use the pythagorean identities in conjunction with previous knowledge to simplify expressions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 3: Sum and Difference Identities	Length: 3 days
Standard(s): HSF.TF.C.9	Academic Vocabulary: Sum/Difference Identities
Lesson Frame:	We will define and prove the sum and difference identities of trigonometric functions. I will use the sum and difference identities in conjunction with previous knowledge to simplify expressions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 4: Double, Half, and Power Reducing Identities	Length: 3 days
Standard(s): HSF.TF.C.9	Academic Vocabulary: Double Angle Identity, Half Angle Identity, Power Reducing Identity
Lesson Frame:	We will define and prove the double angle, half angle, and power reducing identities of trigonometric functions. I will use my knowledge of all trigonometric identities to simplify expressions with trigonometric functions.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:
Topic 5: Trigonometric Equations	Length: 4 days

<b>Unit Name:</b> Analytic Trigonometry	<b>Length:</b> 17 days
<b>Standards:</b> HSF.TF.C.8, HSF.TF.C.9, HSF.TF.B.7	<b>Outcomes:</b> Students will use information learned in this unit about how the interrelationships among the six basic trigonometric functions make it possible to write trigonometric expressions in various equivalent forms.
<b>Essential Questions:</b> How are algebraic properties related to trigonometric functions? How can you rewrite a trigonometric expression into a more useful form? How can you use trigonometric identities to solve equations?	<b>Learning Targets:</b> Students will be able to: -Use basic trigonometric identities to simplify expressions. -Use the pythagorean identities in conjunction with previous knowledge to simplify expressions. -Use the sum and difference identities in conjunction with previous knowledge to simplify expressions. -Use knowledge of all trigonometric identities to simplify expressions with trigonometric functions. -Solve a trigonometric equation using an identity and inverse trigonometry.
Standard(s): HSF.TF.B.7	Academic Vocabulary: Trigonometric Equation, Inverse Operation
Lesson Frame:	We will explore techniques for solving trigonometric functions.
	I will solve a trigonometric equation using an identity and inverse trigonometry.
Performance Tasks: Warmup Problems, Exit Tickets, Challenge Problems, Application Examples	Notes:

September	October	November	December	January	February	March	April	May	June
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